

IPRL Offshoots

USDA-ARS Invasive Plant Research Laboratory
3205 College Ave., Fort Lauderdale, FL 33314



August 2004

Upcoming Events

13th International Conference on
Aquatic Invasive Species
September 19-23, 2004
Ennis, County Clare, Ireland
www.aquatic-invasive-species-conference.org

12th Annual North American
Weed Management Association
(NAWMA) Conference and
Tradeshow
September, 20-23, 2004
Rushmore Plaza Holiday Inn,
Rapid City, South Dakota
www.nawma.org

8th Conference of the
International Society for Plant
Anaerobiosis (ISPA).
September 20-24, 2004
School of Plant Biology,
University of Western Australia
Perth, Western Australia
www.ibba.cnr.it/ispa/8th_conference/index.html

3rd International Conference on
Biological Invasions NEOBOTA
September, 30-October 1, 2004
University of Bern, Switzerland
www.neobiota.unibe.ch

More upcoming events on page 9

The Invasive Plant Research Laboratory has a long history of fighting plants that threaten the greater Everglades ecosystem. Statistics show that, on average, one new non-native plant species per month arrives in Florida. Many of those plants are harmless but some end up escaping into the wild where they can spread unchecked because they have no natural enemies in Florida.

This report is dedicated to those scientists and technicians, past and present, who have devoted their careers to controlling the impact of invasive plants.

John Scoles - Editor

The Invasive Plant Research Laboratory (IPRL) is the only USDA laboratory dedicated solely to research on biological control of invasive plant species. IPRL staff includes eight Entomologists, one Plant Pathologist, one Plant Physiologist, one Molecular Biologist, one Ecologist and five technicians.

The scientists and staff at the IPRL use their expertise on plant and insect ecology, plant and insect genetics, and plant and insect physiology to study and understand the nature of invasive plants and biological control. Research centers on exploration to find potential biological control agents, screening and testing potential biological control agents, rearing, releasing, and monitoring populations of self-perpetuating biological control agents, and developing management strategies to increase the efficacy of naturalized biological control agents.

Facilities

The IPRL has two locations, one in Fort Lauderdale, Florida and another in Gainesville, Florida. The Fort Lauderdale complex is located on the grounds of the University of Florida's 80-acre Fort Lauderdale Research and Education Center. The Gainesville unit is located on Florida Department of Agriculture and Consumer Services property.

The Fort Lauderdale complex includes a newly constructed, fully equipped, 17,000 square foot weed biological control facility with 3000 square feet of greenhouses and laboratories under quarantine containment. The building housing the quarantine includes a fully equipped genomics and plant-pathology laboratory, a methods-development laboratory, and a plant and insect ecology laboratory as well as environmental chambers, a collection room (for voucher specimens), and office and administrative space. The maximum-security portion of the quarantine area is secure enough to allow research on non-native fungal plant pathogens that might be considered for use as classical biological control agents. This complex also includes nine additional laboratories including two general purpose labs with table space for sorting, weighing and drying samples, several greenhouses and screenhouses for growing plants and insects, a shop for fabricating experiments and maintaining equipment and machinery, a support building for storage of equipment, tools, and supplies. The grounds around the complex contain numerous outdoor tanks of varying sizes and shapes for growing aquatic plants and rearing insects, and multiple research plots where the staff conducts experiments with plants and biological control agents.



IPRL containment facility

Photo by John Scoles

The University of Florida also has facilities and resources such as scientists, technicians, laboratories, and equipment that are available to the IPRL, if needed.

The Gainesville complex consists of a small quarantine facility of around 1000 square feet containing a laboratory and two greenhouses, and additional laboratory and administrative space.

The IPRL staff performs a significant amount of field work all across southern Florida and as far away as Texas. For conducting field work, the lab has two airboats, a john boat, a canoe, an all-terrain vehicle, and various motor vehicles (most equipped for off-road use).

Funding

In addition to funds provided by the USDA, the IPRL receives extensive extramural financial support from a diverse array of clientele groups including the South Florida Water Management District, the US Army Corps of Engineers, the National Park Service, the U.S. Fish and Wildlife Service, the Florida Department of Environmental Protection, the Florida Department of Agriculture, Dade County Department of Environmental Resource Management, and others.

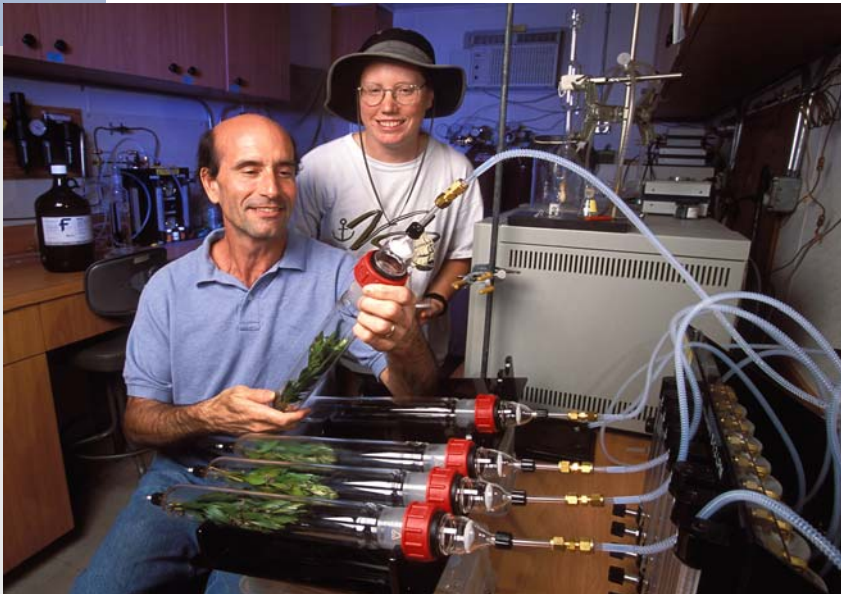
Research

The research conducted at the IPRL principally consists of, but is not limited to, research on plant and insect ecology. The scientists use genetics research to answer questions such as – "what is the origin of an

invasive plant?" Plant and insect ecology research to addresses questions like – "will a potential biological control agent lay eggs or feed on native plants?" and "what impact will a biological control agent have on an invasive plant's ability to spread or grow?" To perform this research, the IPRL has laboratories equipped with a gene sequencer, thermal cyclers, a carbon-nitrogen analyzer, high-performance liquid chromatograph, gas chromatograph and mass

spectrometer, and an electroantennogram, along with ancillary equipment such as an ultra-cold freezer, growth chambers, autoclaves, photosynthesis analyzers, and laminar-flow hoods.

The IPRL is well staffed and well equipped to investigate and respond to the invasive plant issues that continually plague the South Florida ecosystems. ■



Dr. Greg Wheeler and technician Kelly MacDonald conducting pheromone research

Photo by Steve Ausmus

History of Invasive Plant Research: USDA-ARS, Fort Lauderdale, Florida

The Plantation Field Laboratory, as a branch of the University of Florida Everglades Experiment Station, Belle Glade, Florida, was established in 1953 at SW 12th St. (Peter's Rd.), Plantation, Florida on the 90-acre site of the former Peter's family ranch. The use of the land was provided by Mr. Fred Peters, Sr. on a 25-year lease with the understanding that the land was to be used to advance the knowledge of agriculture in south Florida. The objective of the laboratory was to conduct research on problems of vegetable and forage crops on sandy soils of the lower east coast of Florida. In 1954, the United States Department of Agriculture (USDA) Agricultural Research Service (ARS) Soil and Water Conservation Research unit established a hydrological research project to investigate the hydrology of several Florida watersheds. John C. "Jake" Stephens led the project. It was during this time that Jake undertook early research on soil subsidence of the muck soils adjacent to Lake Okeechobee. He also began the first work in Florida on control of aquatic weeds infesting streams and canals, impeding water flow for drainage and irrigation.

A cooperative field survey in 1957 revealed a serious widespread invasion of alligatorweed in the waterways and adjacent areas of south Florida. This led to an intensified and expanded aquatic weed research program at the Plantation location by the addition of Dr. Donald Seaman in 1957. He established the present ARS program which was then in the Crops Research Division, Crops Protection Research Branch, with F. L. Timmons as the Investigations Leader and W. B. Ennis as the Branch Chief. Dr. Seaman resigned in April 1962 for a position with the University of California at Davis, California.

In November, 1959, the U.S. Army Corps of Engineers and the ARS entered into a cooperative agreement to conduct research on the control of aquatic weeds and as a result, support facilities were expanded and



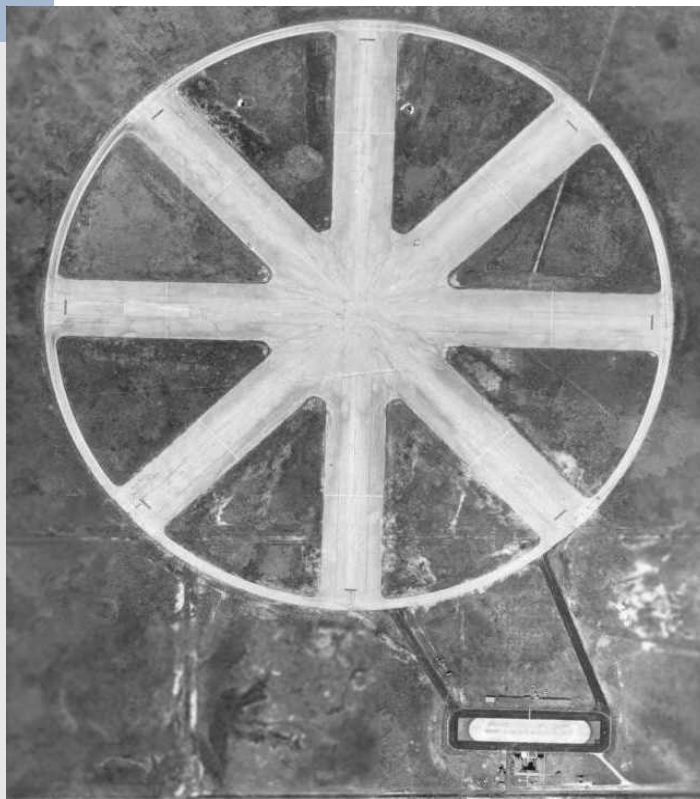
*Forman Field in 1969
when the lab was moved
from Plantation.*

Photo by Philip Busey.

additional personnel were added in the persons of Mr. Robert Blackburn (Botanist, 1959), Dr. Lyle Weldon (Agronomist, 1960), and Dr. Kerry K. Steward (Plant Physiologist, 1966). Dr. Weldon drowned while scuba diving in the process of conducting hydrilla research in 1973. Mr. Blackburn resigned in 1974 for private practice in aquatic weed control.

Dr. David Perkins (Entomologist) transferred to Fort Lauderdale from the South American Biological Control Laboratory (Argentina) in 1973 to conduct research on biological weed control with insects. Dr. Perkins transferred to APHIS in 1978.

Recognizing the need for an expanded facility, the University of Florida procured 100 acres of surplus land at Forman Field in Davie, Florida. This land was formerly a WW II naval air training facility. The old location is now the site of Plantation Heritage Park. The move to the new location began in July 1968 and finished in June 1969. The ARS moved existing buildings from the Plantation field station to the Davie location and these building are still in use. The new quarantine facility now sits adjacent to the original ARS buildings.



*Forman Field in 1948
when it was still used as
an airfield.*

The focus of the aquatic weed research was broadened in the late 1950s and early 1960s as concern for waterhyacinth problems became greater and after hydrilla was introduced into the state. Dr. David Perkins joined the lab in 1973 to conduct research on newly released waterhyacinth biological control agents.

Dr. Perkins was succeeded in 1978 by Dr. Ted Center. In 1989 melaleuca control became a research priority and in 1994, after Dr. Center was appointed the laboratory's Research Leader, the program emphasis began a shift towards biological control research, particularly biological control of melaleuca. Biological control

projects had previously been implemented on alligatorweed (1963-1971), waterhyacinth (1971-1977), hydrilla (1984-present), and waterlettuce (1986-present).

Dr. Gary R. Buckingham (Entomologist), former director of the European Weed Biological Control Laboratory (Rome, Italy), transferred to the quarantine facility in Gainesville in 1977, which was administratively linked to the Fort Lauderdale location in 1985. Dr. Buckingham retired in 2003.

Dr. Thai Van (Plant Physiologist) joined the ARS in 1981 after a stint with the University of Florida. Dr. Robert Pemberton (Entomologist), former director of the Asian Parasite Laboratory, transferred to the IPRL from Seoul, Korea in January 1994.

Dr. Gregory Wheeler (Entomologist) joined the program in January 1994 as a University of Florida post-doctoral appointment. Dr. Wheeler accepted an ARS term appointment in June 1995 and achieved permanent status in June 1998, replacing Dr. Kerry Steward, who retired in January 1998.

In 1996, Dr. Min Rayamajhi (Plant Pathologist) was hired through a cooperative agreement as a University of Florida post-doctoral appointment then joined the ARS in 2002.

Dr. Philip Tipping (Entomologist) and Dr. Paul Pratt (Entomologist) joined the ARS in 1999. Dr. Pratt is currently the director of the TAME Melaleuca area-wide integrated pest management project.

Current projects at the laboratory include work on biological control of melaleuca, salvinia, lygodium, lobate lac scale, skunk vine, and more. The IPRL continues to tackle invasive plant issues and is poised to carry on well into the future.



Dr. Ted Center examines a melaleuca tree at an IPRL research plot.

Photo by Steve Ausmus

Current publications

A major product of any research organization is various kinds of documentation detailing the work being done and the accomplishments being made. Here are a few of the recent publications produced by and about the work at the IPRL.

Popular Press

Silvers, C.S. Status and impacts of the melaleuca biological control program. Wildland Weeds, Florida Exotic Pest Plant Council, Spring 2004.

Ferriter, A. TAME Melaleuca. Wildland Weeds, Florida Exotic Pest Plant Council, Spring 2004.

Woods, C. Taming melaleuca in Florida. IMPACT, University of Florida Institute of Food and Agricultural Sciences, Summer 2004.

Meisenburg, M. Melaleuca as an allergen: setting the record straight. Wildland Weeds, Florida Exotic Pest Plant Council, Spring 2004.

Bernier, L.S. and E. Abreu. Plantas invasoras en Puerto Rico: Melaleuca quinquenervia (Cav.) Blake. Informe Cooperativo DRNA y UPR Numero 4, June 2004.

Overholt, W. A. and P.D. Pratt. 2004. Dispersal of *Oxyops vitiosa*: A Biological Control Agent of Melaleuca in Florida. Univ. of Florida. IFAS Extension Bulletin. ENY-701 3 pp.

Scientific Publications

Costello, S. L., P. D. Pratt, M. B. Rayamajhi, and T. D. Center. 2003. Arthropods associated with above-ground portions of the invasive tree, *Melaleuca quinquenervia*, in south Florida, USA. The Florida Entomologist 86:300-322.

Pratt, P. D., M. B. Rayamajhi, T. K. Van, and T. D. Center. 2004. Modeling the Influence of Resource Availability on Population Densities of *Oxyops vitiosa* (Coleoptera: Curculionidae), a Biological Control Agent of the Invasive Tree *Melaleuca quinquenervia*. Biocontrol Science and Technology 14:51-61.

Web Sites You May Want to Visit

To learn more about invasive plants and what various organizations are doing about them, visit the following sites on the internet.

Agricultural Research Service
www.ars.usda.gov/

Center for Exotic and Invasive Plants
plants.ifas.ufl.edu

Federal Noxious Weed Program
www.aphis.usda.gov/ppq/weeds

Florida Department of Agriculture,
Department of Plant Industry
www.doacs.state.fl.us/~pi/index.html

Florida Department of Environmental Protection,
Bureau of Invasive Plant Management
www.dep.state.fl.us/lands/invaspec/

Florida Exotic Pest Plant Council
www.fleppc.org

Invasive Plant Research Laboratory
www.weedbiocontrol.org/

The National Agricultural Library's Invasive
Species website
www.invasivespecies.gov

National Noxious Weed Program
<http://dogwood.itc.nrcs.usda.gov/weeds>

South Florida Water Management District
www.sfwmd.gov

Southwest Florida Water Management District
www.swfwmd.state.fl.us/

TAME Melaleuca Project
<http://tame.ifas.ufl.edu>

The Nature Conservancy
<http://nature.org/>



Picture of the Month

Cataclysta camptonozale, now known as
Austromusotima camptonozale.

Photo by Christine Bennet

Biological Control Agent for Lygodium Now Ready for Release

On August 17, 2004, the USDA's Animal and Plant Health Inspection Service (APHIS) issued a permit for the release of *Cataclysta camptonozale* in Florida. This moth, now known as *Austromusotima camptonozale*, is the first biological control agent slated for release against the Old World climbing fern, *Lygodium microphyllum*. An official release event will be held sometime in September.

Old World climbing fern is an invasive weed in south Florida where it threatens many wetland communities in the Everglades ecosystem. The fern is native to wet areas in the Old World tropics and subtropics from western Africa to eastern and southern Africa, and eastern India across southeast Asia to northern Australia and the Pacific to Tahiti. The fern entered Florida as a commercial ornamental plant and was first documented as having become naturalized in 1965. However its explosive growth and rapid spread are relatively recent and it is now causing concern because of its dominance of native vegetation in many communities.

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More upcoming events

28TH Annual Florida Aquatic Plant
Management Society Training
Conference
Oct 17-20, 2004
Deerfield Beach, Florida
[www.homestead.com/fapms/
meeting.html](http://www.homestead.com/fapms/meeting.html)

31st Annual Natural Areas
Conference
October 13-16, 2004
Holiday Inn Mart Plaza
Chicago, Illinois
[www.conferences.uiuc.edu/
conferences/
conference.asp?ID=30](http://www.conferences.uiuc.edu/conferences/conference.asp?ID=30)

31st Annual Conference on
Ecosystems Restoration and
Creation
October 28-29, 2004
Crowne Plaza Hotel
Tampa, Florida
[www.hccfl.edu/depts/detp/
ecoconf.html](http://www.hccfl.edu/depts/detp/ecoconf.html)

24th International Symposium of
the North American Lake
Management Society
November 3-5, 2004
Victoria Conference Centre
Victoria, British Columbia
[www.nalms.org/symposia/
symposia.htm](http://www.nalms.org/symposia/symposia.htm)

National Conference on
Ecosystem Restoration
December 6-10, 2004
Wyndham Palace Hotel
Lake Buena Vista, Florida
[http://conference.ifas.ufl.edu/
ecosystem/](http://conference.ifas.ufl.edu/ecosystem/)



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Previous reports are available online at:
<http://tame.ifas.ufl.edu/html/publications.htm>

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